

Special
Report
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U.S. Policy Regarding Limitations on Nuclear Testing



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The United States is committed to a national security policy which includes both a strong deterrent to aggression and an active pursuit of deep, equitable, and verifiable reductions in Soviet and American nuclear arms as well as effective verification arrangements for existing limitations on nuclear testing. Under existing conditions, neither a comprehensive ban nor a moratorium on nuclear testing would enhance the cause of security, stability, or peace. This Special Report sets forth the principles underlying U.S. policy toward limitations on nuclear testing.

Recent Developments

Shortly before this Special Report went to press, the White House announced that the United States and the Soviet Union agreed to have experts meet, without preconditions, to discuss issues related to nuclear testing. An initial meeting of experts was held in late July 1986 at Geneva.

As this report details, the United States has long sought a meeting with the Soviets to present our concerns about the verification provisions of the Threshold Test Ban Treaty (TTBT) and the Peaceful Nuclear Explosions Treaty (PNET). This meeting of experts allows the United States to present its ideas and concerns to the Soviets—and to hear Soviet concerns. The United States is ready to present and discuss our views on verification improvements in existing agreements which we believe are needed and achievable at this time. If we are successful in addressing these

verification concerns, we could move forward on ratification of these two treaties.

A Collective Security Issue

The maintenance of a strong nuclear deterrent has for four decades ensured the security of the United States and the freedom of our allies and friends. Therefore, while a comprehensive test ban remains a long-term objective of the United States and while we are actively investigating technologies that could one day reduce and ultimately eliminate our dependence on offensive nuclear arms for our security, nuclear weapons will remain the key element of deterrence for the foreseeable future. During such a period, where both the United States and our friends and allies must rely upon nuclear weapons to deter aggression, nuclear testing will continue to be required.

A carefully structured nuclear testing program is necessary to ensure that our weapons are safe, effective, reliable, and survivable. The directors of both the Los Alamos and Livermore national weapon laboratories have stated that, while non-nuclear tests sometimes detect problems with the nuclear component of warheads, the most serious problems with the nuclear weapons stockpile are only revealed and solved by actual nuclear testing. Even a seemingly minor modification in a weapon design could seriously undermine confi-

dence in the weapon's effectiveness unless the modified design can be tested with a nuclear yield. Testing also allows us to take necessary steps to modernize our forces to counter the continuing Soviet military buildup, particularly in offensive nuclear capabilities.

The United States has long sought to achieve agreement with the Soviet Union on nuclear testing limitations that could strengthen security for all nations. In 1963, both sides ratified the Limited Test Ban Treaty, which prohibits nuclear explosions in the atmosphere, outer space, and under water. The LTBT also prohibits the release of radioactive debris outside the boundaries of the state conducting a nuclear explosion. In 1974 and 1976, respectively, the United States and Soviet Union signed the Threshold Test Ban Treaty and Peaceful Nuclear Explosions Treaty. These treaties prohibit underground nuclear explosions having a yield that exceeds 150 kilotons. Neither side has ratified the TTBT or PNET, but each has stated that it would respect the 150 kiloton limit.

Verification Problems and Soviet Violations

The United States is not currently seeking ratification of the TTBT and PNET because we cannot effectively verify Soviet compliance with the 150-kiloton threshold on underground nuclear explosions. The remote seismic techniques we must rely on today to monitor Soviet nuclear tests do not provide yield estimates with the accu-

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rary required for effective verification of compliance. Nor will the treaties' verification provisions solve this problem. The TTBT itself provides only for an exchange of data. This data would be of limited value in verification and, in any event, cannot be independently validated by the U.S. Government. This means, for example, that we would have no way of knowing whether the Soviets were providing data for all geophysically distinct testing areas. Yet if the Soviets withheld such knowledge from us, they could conduct high-yield tests in excess of 150 kilotons that, from the perspective of a seismic observer outside Soviet boundaries, could appear to fall within the 150 kiloton limit.

The verification provisions of the PNET Protocol would not resolve the problem of TTBT verification because they are not applicable to weapons tests. They would permit mandatory on-site inspection only of peaceful nuclear explosions—and then only in very restrictive circumstances. Specifically, on-site inspection is mandatory only for a group of explosions whose aggregate yield exceeds 150 kilotons. In fact, since 1976 the Soviets have not conducted any group nuclear explosions of the size which would have required them to permit such inspection. Thus, even if we were to ratify the treaties and implement their verification provisions today, our concerns regarding Soviet compliance with the TTBT would not be resolved.

These verification deficiencies have become a matter of great concern in light of the pattern of Soviet noncompliance with existing arms control agreements, including existing limitations on nuclear testing. As stated in the President's December 1985 "Report to Congress on Soviet Noncompliance With Arms Control Agreements," the Soviet Union's testing practices have resulted in the release of radioactive debris and caused radioactive matter to be present outside the Soviet Union's territorial limits in violation of its legal obligation under the LTBT. The report notes that Soviet venting has occurred on numerous occasions. In his 1984 report, the President concluded that "while the available evidence is ambiguous, in view of ambiguities in the pattern of Soviet testing and in view of verification uncertainties, and [while] we have been unable to reach a definitive conclusion, this evidence indicates that Soviet nuclear activities for a number of tests constitute a likely violation of legal obligations under the TTBT." In his 1985 reports the President reiterated this concern, finding "that Soviet nuclear testing activities for a number of tests consti-

PRESIDENT'S STATEMENT, March 14, 1986

I want to make an announcement today concerning the question of limitations on nuclear testing, an important arms control area which has been the subject of special correspondence which I have had recently with Soviet General Secretary Gorbachev, the leaders of six nations known as the New Delhi Group, and Senate Majority Leader Dole.

I have conveyed to General Secretary Gorbachev today a new, very specific, and far-reaching proposal concerning nuclear testing limitations, a proposal which could be implemented immediately. In this new initiative, I urged the Soviet Union to join us without delay in bilateral discussions on finding ways to reach agreement on essential verification improvements of the Threshold Test Ban Treaty (TTBT) and Peaceful Nuclear Explosions Treaty (PNET).

In the field of nuclear testing, as in arms control generally, effective verification is a central element. It has also long been one of the most difficult problems to resolve. We are seriously concerned about the past pattern of Soviet testing as well as current verification uncertainties and have determined that a number of Soviet tests constitute likely violations of obligations under the Threshold Test Ban Treaty of 1974. The inadequacy of the monitoring regime provided for in that agreement is underscored by the Soviet Union's own questions concerning the yields of particular U.S. tests, all of which, in fact, have been below the 150-kiloton threshold.

The United States places the highest priority in the nuclear testing area on finding ways of ensuring effective verification of the TTBT and PNET. I have already made several specific suggestions to the Soviet Union in this regard. My new initiative is a further attempt to build the necessary basis for confidence and cooperation between our nations regarding such limitations.

As a reflection of our resolve to make tangible progress, in my new proposal I

identified to Mr. Gorbachev a specific new technical method—known as CORRTX—which we believe will enable both the U.S. and U.S.S.R. to improve verification and ensure compliance with these two treaties. This is a hydrodynamic yield measurement technique that measures the propagation of the underground shock wave from a nuclear explosion. I provided to Mr. Gorbachev a technical description of CORRTX designed to demonstrate how this method will enhance verification procedures.

To allow the Soviet Union to examine the CORRTX system more fully, I further proposed that Mr. Gorbachev send his scientists to our Nevada test site during the third week of April 1986. At that time, they could also monitor a planned U.S. nuclear weapons test. I would hope this would provide an opportunity for our experts to discuss verification methods and thus pave the way for resolving the serious concerns which have arisen in this area.

In making this offer, I made clear to General Secretary Gorbachev that, if we could reach agreement on the use of an effective verification system incorporating such a method to verify the TTBT, I would be prepared to move forward on ratification of both the TTBT and PNET.

What is unique about this new initiative is its specificity and concreteness and the detailed new technical information we have provided to the Soviet Union in trying to solve these verification uncertainties. It is important that the Soviet Union engage with us now in this first practical step to improve the confidence we each must have in treaty compliance with the 150-kiloton threshold on underground tests. If this can be achieved, we believe we will have significantly improved the prospects for verifying other arms control agreements as well through improved verification regimes.

NOTE: The President's March 7 letter to Senate Majority Leader Dole, to which reference is made in the above statement, is included in Appendix 2.

tute a likely violation of legal obligations under the TTBT of 1974. . . ."

U.S. Presidential Initiatives

President Reagan has long advocated a dialogue with the Soviet Union to arrive at the required improvements in monitoring procedures for effective verification of the TTBT and PNET, which are the necessary first steps if there is to be progress in the area of nuclear testing limitations. The United States has taken the following initiatives:

- On several occasions in 1983, the United States unsuccessfully sought to engage the Soviet Union in discussions

on verification improvements to these treaties.

- In September 1984, the President proposed, in an address to the UN General Assembly, that the United States and the Soviet Union find a way for Soviet experts to come to the U.S. nuclear test site and for our experts to go to the Soviet test site to measure directly the yields of nuclear weapons tests.

- In July 1985, the President invited Soviet experts to come to the U.S. test site to measure the yield of a U.S. test with any instrumentation devices they deemed necessary for measuring yield. There were no conditions or require-

ments for a reciprocal visit. The President's purpose was to begin a process to build confidence and cooperation between our nations regarding limitations on nuclear weapons testing.

• In December 1985, the President proposed to General Secretary Gorbachev that U.S. and Soviet experts on nuclear testing limitations meet in February to discuss our respective verification approaches and to address initial tangible steps to resolve this issue.

The President's Proposal of March 1986

In his most recent initiative, on March 14, 1986, the President urged the Soviet Union to begin bilateral discussions to find ways to reach agreement on essential verification improvements of the TTBT and PNET. The President provided General Secretary Gorbachev with a technical description of a specific method known as CORRTEx, which is an accurate method for measuring the yield of a nuclear explosion (see Appendix 1). The President also proposed, on a unilateral basis, that Soviet experts visit our Nevada test site in April to discuss verification methods, examine the CORRTEx system more closely, and monitor a planned U.S. nuclear weapon test. The President stated that if the United States and the Soviet Union could reach agreement on the use of an effective verification system incorporating CORRTEx, the United States would be prepared to move forward with the ratification of the TTBT and PNET.

The President's proposal offers an opportunity for the Soviets to demonstrate that they take testing limitations seriously and recognize that compliance with such agreements is necessary. The United States must stand by its standard of effective verification with respect to the TTBT. Anything less would harm U.S. security interests, undermine our ability to demand effective verification in other arms control areas, and undercut the objectives of the TTBT.

Comprehensive Test Ban

A Comprehensive Test Ban (CTB) remains a long-term objective of the United States. As long as the United States and our friends and allies must rely upon nuclear weapons to deter aggression, however, some level of nuclear testing will continue to be required. We believe such a ban must be viewed in the context of a time when we do not need to depend on nuclear deterrence to ensure international security and stability and when we have achieved broad,

deep, and verifiable arms reductions, substantially improved verification capabilities, expanded confidence-building measures, and greater balance in conventional forces. For our part, the United States is energetically pursuing negotiations and discussions with the Soviet Union on concrete steps in all of these areas. We have made clear our strong and continuing view that Soviet calls for an immediate and unverifiable nuclear testing moratorium are not a basis for meaningful progress to this end.

At the same time, the United States has supported international discussion of verification and compliance problems related to nuclear testing limitations. Discussions have taken place in past years at the multilateral Conference on Disarmament (CD) in Geneva, in both a technical-level ad hoc group of scientific experts and in the Nuclear Test Ban Working Group. We continue to support consideration of scope, verification, and compliance issues related to a CTB in these two groups at the CD.

Appendix 1

CORRTEx System of Direct Yield Measurement

CORRTEx (Continuous Reflectometry for Radius versus Time Experiment) is a hydrodynamic yield measurement technique that measures the propagation of the underground shock wave from an explosion. This technique uses a coaxial cable which can be emplaced in a hole parallel to the device emplacement hole. Precise measurements are made of the length of the cable by timing the return of low energy electrical pulses sent down to, and reflected from, the cable end. When the nuclear device is detonated, a shock wave emanates through the ground, crushing and shortening the cable. The rate by which the cable length changes is recorded via measurements of the changing pulse transit times. This rate is a measure of the propagation rate of the explosive shock wave through the ground which is, in turn, a measure of the yield of the nuclear explosion.

CORRTEx has been shown to be accurate to within 15% of the more accurate, radio-chemical yield measurements for tests of yield greater than 50 kilotons and in the geologic media of the U.S. test site in Nevada. Use of CORRTEx-measured yields at the Soviet Shagan River test site should provide accuracies to within 30%. The U.S. estimate is based on its use in over 100 tests with the sensing cable in the device emplacement hole and four tests

with cables in a satellite hole. The accuracy of the technique is believed to be relatively, but not wholly, independent of the geologic medium, provided the satellite hole measurements are made in the "strong shock" region near the nuclear device explosion. At greater separation distances, the properties of the medium become much more important factors. A satellite hole separation distance of 14 meters (46 feet) is appropriate for a test near 105 kilotons.

The electronic device that provides the timing signals is a battery-powered, suitcase-sized unit that may be remotely controlled. All equipment for power, recording, and data reduction can be contained in a small trailer.

Appendix 2

The President's Letter to Majority Leader Dole, March 7, 1986

In early 1986, the U.S. Congress debated a joint resolution "To Prevent Nuclear Testing." The President expressed his reservations with regard to this resolution in a letter dated March 7, 1986, to Senate Majority Leader Robert Dole. Referring to provisions of the resolution, the President noted: "They would undercut the initiatives I have proposed to make progress on nuclear test limitations issues, and they would set back prospects on a broad range of arms control efforts, including the achievement of deep, stabilizing, and verifiable arms reductions." Following is the full text of that letter.

THE WHITE HOUSE
WASHINGTON

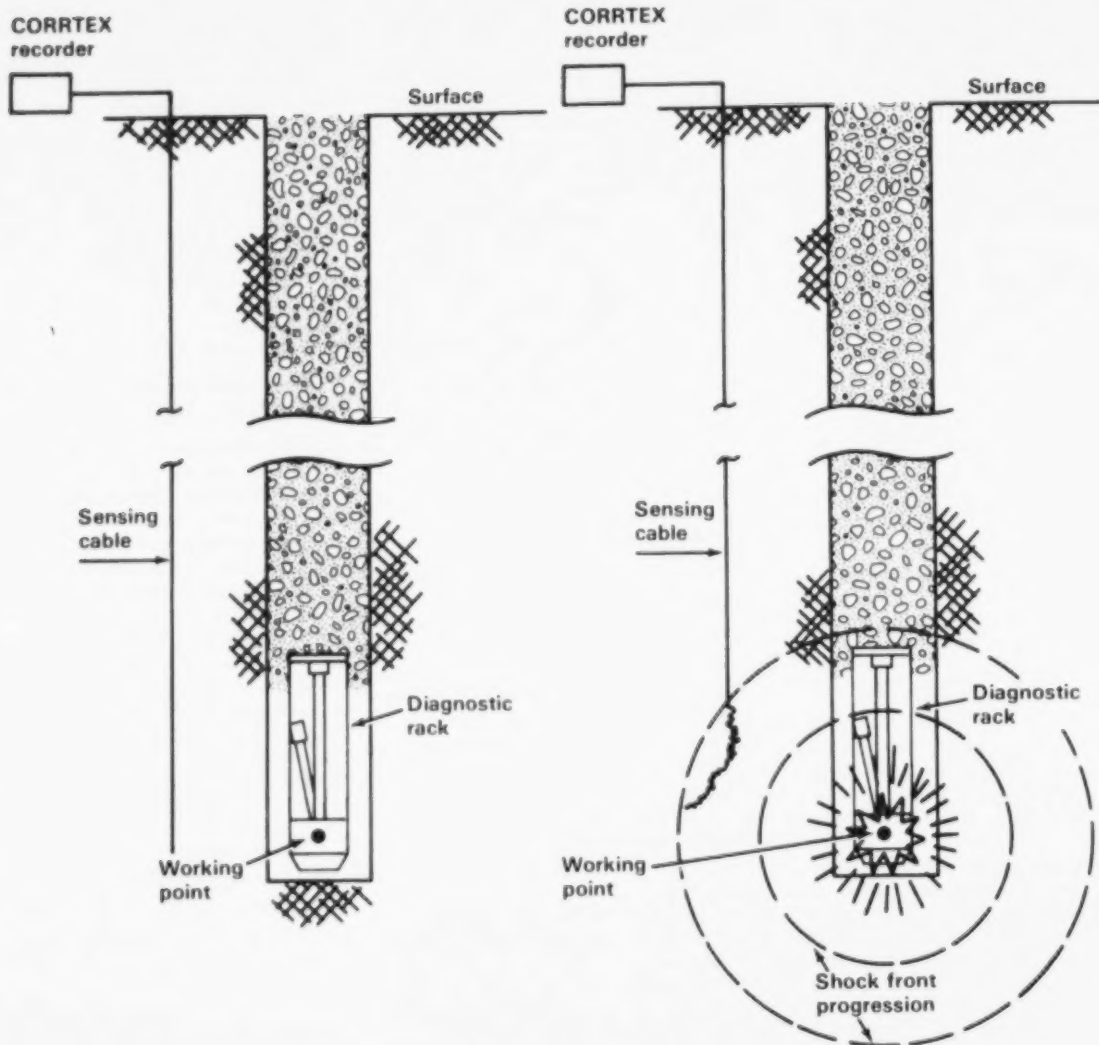
March 7, 1986

Dear Bob,

As you know, on February 26 the House of Representatives passed H.J. Res. 3, "To Prevent Nuclear Testing," and this issue is now before the United States Senate. The resolution calls for the immediate ratification, without needed verification improvements, of both the Threshold Test Ban Treaty (TTBT) and the Peaceful Nuclear Explosions Treaty (PNET). It also calls for the resumption of negotiations with the Soviet Union toward a Comprehensive Test Ban (CTB), despite the fact that the U.S. Government has made clear its very serious reservations in taking such a step under present conditions.

Any limitations on nuclear testing must be compatible with our security interests and must be effectively verifiable. Because of the continuing threat that we face now and for the foreseeable future, the security of the United States, its friends and its Allies must

CORRTEX YIELD MEASUREMENT CONCEPT



Typical cable emplacement
in satellite hole

Moving shock wave from
nuclear detonation
crushes and shortens cable

rely upon a credible and effective nuclear deterrent. A limited level of testing assures that our weapons are safe, effective, reliable and survivable and assures our capability to respond to the continued Soviet nuclear arms buildup. Such testing, which is conducted underground, is permitted under the existing agreements on nuclear test limitations, all of which the United States fully complies with—the TTBT, the PNET, and the Limited Test Ban Treaty (LTBT).

A CTB remains a long-term goal of the U.S. However, it must be viewed in the context of achieving broad, deep and verifiable nuclear arms reductions, substantially improved verification capabilities, a greater balance in conventional forces and at a time when a nuclear deterrent is no longer as essential an element as currently for international security and stability.

A first, priority step toward this goal is the pursuit of equitable and verifiable arms reductions in the current negotiations in Geneva on nuclear and space arms. We are, at the same time, seeking Soviet agreement to enhanced verification measures for the TTBT and PNET and are discussing verification problems of a CTB at the Conference on Disarmament in Geneva. Our concerns are heightened by the pattern of Soviet noncompliance with its arms control obligations, including current agreements on limiting nuclear testing.

Our efforts to achieve essential verification improvements include three approaches to the Soviets in 1983 to engage in discussion. In 1984 I proposed an exchange of Soviet and U.S. experts to measure directly the yields of tests of nuclear weapons at each other's test sites. In mid-1985, I unconditionally invited Soviet experts to measure such a test at the Nevada Test Site, bringing with them any instrumentation devices they deemed necessary. In December, 1985, I proposed to Secretary General Gorbachev that U.S. and Soviet experts on nuclear testing limitations meet in February, 1986, to discuss our respective verification approaches and to address initial tangible steps to resolve this issue.

Regrettably, the Soviet Union has thus far not responded either to the serious U.S. concern in this area or to any of our initiatives to address these concerns in a constructive manner.

The actions called for by H.J. Res. 3 do not serve the interests of the United States, our Allies and our friends. They would undercut the initiatives I have proposed to make progress on nuclear test limitations issues, and they would set back prospects on a broad range of arms control efforts, including the achievement of deep, stabilizing, and verifiable arms reductions.

Sincerely,

RON

Appendix 3

Lessons of the 1958-61 Moratorium

The United States does not believe that a testing moratorium is a prudent, effective, or constructive step along the path toward our goal of a safer world. A look back at the 1958-61 testing moratorium demonstrates why the United States believes that moratoria are never acceptable substitutes for negotiated, equitable, and effectively verifiable arms control agreements.

There were three unilateral, voluntary pledges to suspend testing in the late 1950s: the United States and the United Kingdom acted in 1958, followed by the Soviet Union in 1959 (although the Soviets suspended testing in November 1958). These suspensions amounted to a de facto moratorium. There was, however, no joint formal agreement. Thus, given a de facto moratorium by the United States, the United Kingdom, and the Soviet Union beginning in late 1958, the question is: who was the first to resume testing? The verdict of history is clear: it was the Soviet Union.

The following is a chronology of key statements and actions related to the 1958-61 moratorium:

1958

March 31. The Soviet Union unilaterally suspends testing after a major test series but just prior to an announced U.S. test series. The United States and the United Kingdom reject the Soviet call to suspend testing, but President Eisenhower proposes a meeting of technical experts to study the practical problems regarding international control of an agreed disarmament program.

July 1. An exchange of letters between Eisenhower and Soviet leader Khrushchev results in the convening of a Conference of Experts in Geneva to study the problems of verifying a test ban.

August 21. The Conference of Experts reports that it is technically feasible to establish a workable and effective system, using available capabilities, to monitor compliance with a worldwide suspension of nuclear testing.

August 22. Based on the experts' report, Eisenhower proposes trilateral negotiations on a verifiable test ban. He also expresses willingness to suspend testing for 1 year (on a renewable basis) beginning October 31, 1958, the date of the opening of the Geneva Conference on Discontinuance of Nuclear Weapons Tests. The United Kingdom follows suit.

September 23. The United Kingdom ends testing series begun in May 1958.

September 30. The Soviet Union resumes testing.

October 30. As promised in August, the United States ends testing. The Geneva Conference on Discontinuance of Nuclear Testing convenes the following day.

November 3. The Soviet Union ends testing.

November 7. Eisenhower states that, in light of Soviet tests after the opening of the Geneva conference, the United States considers itself free from its pledge. He adds that the United States, nevertheless, would continue the testing suspension and hopes the Soviet Union will do the same.

1959

January 5. The United States reopens the verification issue based on the finding by U.S. seismic experts that earlier assessments by the Geneva experts regarding verification of underground tests were too optimistic. The Soviets refuse to consider the new U.S. data.

August 26. Eisenhower extends U.S. moratorium until the end of the year. Two days later, the Soviets pledge "not to resume nuclear tests... if the Western Powers do not resume the testing of atomic and hydrogen weapons. Only in the case of resumption by them of nuclear weapons tests will the Soviet Union be free from this pledge." It should be noted that given the Soviet emphasis on "resumption," the term "Western Powers" can only refer to the United States and the United Kingdom—the only Western Powers to have tested at that time.

December 29. Eisenhower denounces the intransigence of Soviet technical experts in Geneva, who refuse to address deficiencies in seismic monitoring of underground nuclear explosions. He announces that "the voluntary moratorium on testing will expire on December 31. Although we consider ourselves free to resume nuclear testing, we shall not resume nuclear weapons tests without announcing our intention in advance of any resumption. During the period of voluntary suspension of nuclear weapons tests the United States will continue its active program of weapon research, development and laboratory-type experimentation."

December 30. Khrushchev states that the Soviet Union would not resume testing until the "Western Powers" resume.

1960

February 13. France, which had indicated its intention to become a nuclear power as early as March 1957, conducts its first test.

April 1. France conducts a second test.

December 27. France conducts a third test.

1961

April 25. France conducts a fourth test.

May 15. The Soviet Union states that "if France continues" testing, the Soviet Union would be compelled to test.

August 30. Although the French have not conducted another test, the Soviet Union announces it would resume testing—contrary to its statements of August 28, 1959, and May 15, 1961.

August 31. Khrushchev tells visiting British parliamentarians that he decided to resume testing with a bomb of unprecedented proportions to shock the Western Powers into negotiations on Germany on his terms, and into accepting his demand that Geneva test-ban negotiations be merged with those on general and complete disarmament.

September 1. The Soviet Union resumes atmospheric testing.

September 5. President Kennedy authorizes underground testing, which resumes on September 15.

November 4. The Soviet Union concludes its test series, of over 40 tests, including the largest single explosion in history.

November 7. Seven months after the Soviet warning against continued testing, France conducts a fifth nuclear test.

The preceding chronology clearly demonstrates that the Soviets broke their own pledges as well as the moratorium then still being observed by the United States and the United Kingdom. In addition, Khrushchev's candid admission of August 1961, and the size of the ensuing test series, undercuts arguments that French testing or Eisenhower's December 1959 statement in any way "justified" the Soviets' breaking of the moratorium. Indeed, Soviet evidence of bad faith was so clear that, in an address to the American people in March 1962, Kennedy summed up the experience as follows:

[O]n September 1st of last year, while the United States and the United Kingdom were negotiating in good faith at Geneva, the Soviet Union callously broke its moratorium with a 2-month series of more than 40 nuclear tests. Preparations for these tests had been secretly underway for many months. Accompanied by new threats and new tactics of terror, these tests—conducted mostly in the atmosphere—represented a major Soviet effort to put nuclear weapons back into the arms race....

Some may urge us to try it [a moratorium] again, keeping our preparations to test in a constant state of readiness. But in actual practice, particularly in a society of free choice, we cannot keep topflight scientists concentrating on the preparation of an experiment which may or may not take place on an uncertain date in the future. Nor can large technical laboratories be kept fully alert on a standby basis waiting for some other nation to break an agreement. This is not merely difficult or inconvenient—we have explored this alternative thoroughly, and found it impossible of execution. ■

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